REMARKS

Claims 1-3 and 6-14 are now in the application. Claim 1 has been to recite "a conjugated diene-based monomer, or an aromatic vinyl monomer and a conjugated diene monomer". Claims 7 and 8 were amended to recite "a conjugated diene-based monomer". The amendments to the claims do not introduce any new matter.

The rejection of the claims 1-3 and 6 - 14 under 35 U.S.C. 112, second paragraph has been overcome by the amendments to the claims.

Claims 1, 2, 6, 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,270,394 to Hoxmeier in view of U.S. Patent 3,923,722 to Lakshmanan. Claims 1, 2, 6, 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,270,394 to Hoxmeier in view of U.S. Patent 6,186,202 to Majumdar et al. Claims 1 - 3 and 6 - 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,270,394 to Hoxmeier in view of JP 59-12948 to Nakajima et al.

The cited references fail to render obvious the present invention.

As is clear from the above claims, an important aspect of the present invention resides in the use of the modified conjugated diene-based polymer, together with a rubber component and a reinforcing filler (i.e., carbon black and/or silica), in the rubber composition. The modified conjugated diene-based polymer is synthesized by reacting growing terminal anions formed by anionic polymerization of a conjugated diene-based monomer, or an aromatic vinyl monomer and a conjugated diene monomer, with a fullerene. The amount of the fullerene bonded to the terminal end of the modified conjugated diene-based polymer is 0.001 to 2 molecules per one molecular chain of the modified conjugated diene-based polymer.

As a result, the rubber composition, which is suitable for use as, for example, a rubber for a tire tread, having an excellent processability, superior balance between the modulus and the heat buildup, excellent cold flowability and superior tan δ balance, a low tan δ value at 60°C (i.e., smaller rolling resistance) and high tan δ value at 0°C (i.e., larger wet skid resistance and better breaking performance on a wet road), as shown in the results of the Examples of the present application. (please see Tables I and II and Figs. 1 and 2).

More specifically, the fullerene-modified IR-FUL according to the present invention (please see Example 1) exhibited the excellent balanced properties of the high 300% modulus, the low tan δ (60°C) and the good processability, when compare with the non-modified IR-A, B, C and D (please see Table I). As shown in Fig. 1, IR-FUL exhibits completely different phenomena from the non-modified IR-A, B, C and D. IR-B and IR-C exhibited the similar level of tan δ, but the 300% Modulus values are largely different from that of IR-FUL and the processabilities of IR-B and C are poor, as shown in Table I.

In addition, the fullerene-modified SBR-FCP according to the present invention (please see Example 2) exhibited the excellent balanced properties of the low tan δ (60°C), the high tan δ (0°C) and the high balance of tan δ (10°C)/tan δ (60°C) and no cold flow when compare with the non-modified SBR-A, B and NF, as shown in Table II. As shown in Fig. 2, the modified FCP exhibits the quite different phenomena from the non-modified SBR-A, B and NF in the relationship of tan δ (0°C)/tan δ (60°C) ratio and weight-average MW.

The cited references are silent with respect to the above composition according to the present invention and the advantageous effects obtained therefrom.

US Patent 5,270,394 to Hoxmeiyer suggests a coupled polymer obtained by contacting the living polymer arms with a fullerene. However, Hoxmeiyer neither discloses nor teaches the use of the resultant coupled polymer. More specifically, the use of the coupled polymer with carbon black and/or silica is completely absent in Hoxmeiyer.

In addition, the above-mentioned advantageous effects obtained therefrom, suitable for use as a tire tread when compounded with carbon black and/or silica, are completely absent in US Patent 5,270,394.

Lakshmanan fails to overcome the above discussed deficiencies of Hoxmeiyer with respect to rendering unpatentable the present invention. U.S. Patent 3,923,722 to Lakshmanan suggests an adhesive composition consisting essentially of an SBR block copolymer, a tackifier, calcium carbonate and a hydrocarbon solvent.

However, the use of the present modified conjugated diene-based polymer having a fullerene bonded thereto in the specified amount is completely absent in this citation. Moreover, U.S. Patent

3,923,722 does not teach the use of the composition as a tire tread, but relates to the use of the composition as an adhesive.

Majumdar fails to overcome the above discussed deficiencies of Hoxmeiyer with respect to rendering unpatentable the present invention. U.S. Patent 6,186,202 to Majumdar et al. suggests a silica-reinforced solventless adhesive composition for a cushion layer containing a diene elastomer and carbon black. However, the use of the fullerene-modified conjugated diene-based polymer or copolymer with carbon black and/or silica for a tire-tread is completely absent in the citation.

Nakajima fails to overcome the above discussed deficiencies of Hoxmeiyer with respect to rendering unpatentable the present invention. JP 59-12948 to Nakajima et al. discloses a sponge rubber comprising a polymer consisting of a solution-polymerized SBR and an ethylene-α-olefin-unconjugated diene copolymer, a furnace carbon black containing, compounded thereto, (A) furnace carbon black, (B) a nitroso-based foaming agent and a urea-based foaming auxiliary, (C) a thiazole-based accelerator and a thiuram-based accelerator.

However, the cited sponge rubber is completely different from the present rubber composition having the characteristics suitable for use as a tire tread. The use of the carbon black with the present fullerene-modified conjugated diene-based polymer for the purpose of solving the objects of the present invention is not motivated by JP 59-12948 to Nakajima et al.

Furthermore, the cited art lacks the necessary direction or incentive to those or ordinary skill in the art to render the rejection under 35 USC 103 sustainable. The cited art fails to provide the degree of predictability of success of achieving the properties attainable by the present invention needed to sustain a rejection under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc*, 127 S.Ct. 1727; 82 USPQ2d 1385 (2007), *Diversitech Corp. v. Century Steps, Inc.* 7 USPQ2d 1315 (Fed. Cir. 1988), *In re Mercier*, 185 USPQ 774 (CCPA 1975) and *In re Naylor*, 152 USPQ 106 (CCPA 1966).

Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc*, supra; 82 USPQ2d 1385 (2007),*Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d. 1923 (Fed.

Cir. 1990), *In re Antonie*, 195 USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ 519 (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited art. Along these lines, see *In re Papesch*, supra, *In re Burt et al*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973).

In view of the above, reconsideration and allowance are respectfully solicited.

In the event the Examiner believes an interview might serve in any way to advance the prosecution of this application, the undersigned is available at the telephone number noted below.

Please charge any fees due with this paper to our Deposit Account No. 22-0185, under Order No. 21713-00055-US1 from which the undersigned is authorized to draw.

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